and Bura Oliverian

NUCLEAR INCIDENT CONTINGENCY PLAN

UNCLASSIFIED

TABLE OF CONTENTS

Preface	1
Introduction	2
FBI Responsibilities	4
FBI Command Post Structure	5
Definitions	7

PREFACE

Within the United States, the FBI has been designated as the lead law enforcement agency in responding to threats or acts of terrorism, to include terrorist threats involving nuclear weapons or materials. The FBI derives its fundamental legal jurisdiction to deter, investigate, direct, organize and prepare for a nuclear terrorist incident from an assortment of Federal statutes and executive branch directives. In order to facilitate the FBI's response to terrorist or criminal-related nuclear incidents occurring within the United States or its territories, the FBI's Nuclear/Biological/Chemical Proliferation Unit, Domestic Terrorism/Counterterrorism Planning Section, National Security Division, FBI Headquarters (FBIHQ), has developed the Nuclear Incident Contingency Plan (NICP). The NICP marshals FBI and other specialized Federal resources to the incident. State/local resources, especially first responders, will play an important role in support of the FBI's Special Agent in Charge (SAC) /On Scene Commander (OSC) when faced with a nuclear incident.

The NICP outlines the FBI's responsibility of notifying pertinent agencies and deploying the necessary technical resources to assist FBI field operations in investigating, containing and minimizing the consequences of the threat.

This document, which provides a general overview of the FBI's NICP, is designed to be utilized as a basic resource only and should not be relied upon for precise answers to specific and complex questions and problems.

*All nuclear threats and/or incidents should immediately be reported to the nearest FBI office.

INTRODUCTION

The NICP is designed to provide the FBI with information which will aid in the thwarting and crisis management of a terrorist or criminal-related nuclear incident. Although the United States has never been faced with a full-scale nuclear terrorism incident, the magnitude of destruction from a nuclear yield or the public terror which would result from even a credible threat of a radioactive release among the populace, undoubtedly would appeal to certain criminal or terrorist elements.

Of particular concern to U.S. law enforcement and intelligence agencies is the attempt by several state sponsors of terrorism to acquire the knowledge and technology necessary to establish an indigenous nuclear program capable of producing Special Nuclear Material and nuclear weapons.

Any type of nuclear or radiological device should be considered a weapon of mass destruction. Consequently, any attempt to purchase materials and technology associated with the production of such devices continues to threaten the United States and will be aggressively investigated and prosecuted.

The complexity of a terrorist or criminal-related nuclear incident requires that the FBI rely on the expertise of other Federal agencies, such as the Department of Defense (DOD) and the Department of Energy (DOE), to assist in the resolution of a crisis. Without the technical and scientific expertise of these agencies, it would be virtually impossible for the FBI to successfully resolve a nuclear crisis. The DOE provides experts trained to search and locate either a nuclear device or nuclear material, as well as personnel equipped to diagnose, disable or limit the detonation of a nuclear device. The DOD provides personnel trained to disarm and dismantle an explosive device and those booby traps surrounding the device.

In addition to DOD and DOE, the FBI relies on Federal agencies such as the Nuclear Regulatory Commission (NRC), Federal Emergency Management Agency (FEMA), U.S. Public Health Service (USPHS), and the Environmental Protection Agency (EPA) if crisis management evolves into consequence management. The FBI also relies on state and local law enforcement, fire/rescue and emergency medical services agencies. Even with this unique alliance of agencies, the FBI has the tremendous investigative burden of locating the general vicinity of the nuclear device.

In order to ensure that the FBI is able to efficiently manage not only FBI activity, but the activities of the other

involved agencies, the FBI developed the Joint Operations Center (JOC) concept. This concept represents a change in the method of coordinating the interagency approach to nuclear-related terrorism matters within the United States. The JOC consists of a standard FBI crisis command post which is enlarged in a unique fashion to better address the specialized and complex demands created by a nuclear terrorism incident.

The FBI's NICP would be implemented immediately upon receipt of information relating to a credible nuclear terrorism threat or incident. This plan notifies the necessary FBI personnel, and ensures that the management of the crisis is swiftly and competently initiated and implemented. In addition, the plan marshals specialized resources and personnel from the DOE and DOD, as well as other involved Federal agencies, who possess the specialized technical expertise to assist the FBI in resolving such an incident. Furthermore, all FBI field offices maintain site-specific nuclear contingency plans, which are regularly updated.

A nuclear terrorism or criminal-related incident occurs when one or more of the following occur:

- the detonation of a nuclear device;
- the theft of a nuclear device;
- the illegal sale, illegal purchase, or theft of Special Nuclear Material, Controlled Nuclear Material, By-Product Material or Source Material;
- the production and/or detonation of an Improvised Nuclear Device (IND);
- the production and/or detonation of a Radiological Dispersal Device (RDD);
- the sabotage of a nuclear facility or facility housing nuclear materials;
- the threat to accomplish any of the above.

Although the practical likelihood of an act of nuclear terrorism occurring in the near future remains low, the FBI is committed to confront and handle such an event.

FBI RESPONSIBILITIES

Pursuant to the FBI's responsibility to respond to terrorist or criminal-related nuclear incidents, the FBI maintains a measured tactical response capability to respond to terrorist incidents nationwide. Upon the receipt of a credible nuclear threat or the confirmed existence of a nuclear weapon, an Improvised Nuclear Device (IND) or a Radiological Dispersal Device (RDD), the FBI is prepared to deploy a number of resources to the scene. The extent and level of response depends on the circumstances of the incident.

FBIHQ will immediately notify the DOE Emergency Operations Center of the threat. The threat will be analyzed by the DOE threat credibility assessment system. The DOE managed assessment process is designed to assist the FBI in assessing the credibility of a specific nuclear threat. It augments other FBI investigative and intelligence information which is being gathered concurrently. If the threat is deemed to be credible, the FBI's NICP would be initiated and the FBI would conduct the following:

Establish a Joint Operations Center (JOC) comprised of representatives from other Federal agencies; state/local law enforcement and first responder agencies as deemed appropriate by the On Scene Commander (OSC). This action is designed to facilitate FBI response and interagency coordination.

Within the JOC, establish command, operations, consequence management and support groups, all of which are designed to reinforce and enhance interagency operations.

Direct on-site Federal response activities through the FBI OSC.

Coordinate all operational aspects of the incident.

Provide security, or other appropriate support, to DOE and DOD personnel as necessary.

Staff a headquarters level 24-hour command center, and provide direct liaison to DOD and DOE command centers as warranted.

During any or all of the above listed actions, the FBI would be concurrently requesting the assistance of DOD and DOE assets to deal with the crisis. These assets would be deploying to the scene as rapidly as possible.

In particular, the DOE's Nuclear Emergency Search Team (NEST) and other specialized assets would be deployed to the scene of a nuclear crisis. NEST, which is one of many of the DOE's assets utilized in the response to a nuclear threat or incident, was designed by the DOE to conduct, direct, and coordinate search and recovery operations for nuclear materials, weapons or devices; to assist in the identification and deactivation of INDs and/or RDDs; and render advice on radiation and damage probabilities in the event of the detonation of an IND. The NEST maintains this technical support capability in a 24-hour state of readiness in order to provide an immediate response to a nuclear emergency.

State and local law enforcement agencies play an important role in immediate and graduated response capability. First responders safeguard lives and, if possible, contain the situation until arrival of additional Federal assets. Even after the arrival of Federal assets, i.e. FBI, DOD, DOE, NRC and consequence management personnel, continued coordination with state and local law enforcement agencies will be vital.

FBI COMMAND POST STRUCTURE (The Joint Operations Center Concept)

The FBI field division's SAC, or other designee as selected by the Director of the FBI, will establish a Joint Operations Center (JOC). The JOC will include Federal, state and local agencies to not only enhance interagency cooperation, but also capitalize on the resources accessible to each agency. The JOC concept has been designed to reflect the FBI's responsibility and authority as the lead Federal agency during a terrorist or criminal-related nuclear incident and to facilitate the FBI's management of such a complex interagency operation. The JOC will be under the direction of the SAC or designee who will function as the "OSC."

The JOC will be composed of four main groups: Command, Operations, Consequence Management and Support. Some of these groups will contain other components to assist that group in fulfilling its responsibilities. The groups and components are described as follows:

COMMAND GROUP: This group will be comprised of senior officials of the FBI, DOD, DOE, NRC, USPHS, FEMA and other Federal, state and local agencies as selected by the FBI, to provide the OSC with a means to quickly coordinate and reach decisions on interagency matters that affect the resolution of the incident. Representation of agencies at Command Group briefings and meetings will be determined by the FBI OSC.

OPERATIONS GROUP: This group will be established by and under the direction of the FBI. This group will contain representatives of organizations that are directly involved in actions in and around the crisis site and whose actions are deemed critical to the successful resolution of the crisis.

OPERATIONS GROUP COMPONENTS: Depending on the crisis, some or all of these components may be staffed and used to resolve the crisis. Each organization represented in the Operations Group will provide a representative to each of these components.

- 1. INTELLIGENCE COMPONENT
- 2. INVESTIGATIVE COMPONENT
- 3. TACTICAL COMPONENT
- 4. TECHNICAL COMPONENT
- 5. SURVEILLANCE COMPONENT
- 6. NEGOTIATIONS COMPONENT

CONSEQUENCE MANAGEMENT GROUP: Established by, and initially under the direction of the FBI, to manage the additional Federal, state and local assets that will respond to any incident that has the potential for generating mass casualties or destruction.

SUPPORT GROUP: This group will be established by and under the direction of the FBI. This group will contain representatives of organizations whose primary task is to support members of the Operations Group. It is within this group that most organizational variations occur. Often, the Legal and Media components are assigned in direct support to the Command Group. The following components are supervised by the Support Group:

- 1. MEDIA
- 2. LEGAL
- 3. ADMINISTRATIVE
- 4. LOGISTICS
- 5. LIAISON

DEFINITIONS

By-Product Material: Any radioactive material (except Special Nuclear Material) yielded in or made radioactive by exposure to radiation that is incident to the production or use of Special Nuclear Material.

Consequence Management: The management of Federal, state and local assets which will respond to any incident that has the potential for generating mass casualties or destruction. This includes appropriate planning and response efforts in concert with law enforcement crisis management efforts.

Improvised Nuclear Device (IND): An IND is defined as a device incorporating radioactive materials designed to result in the formation of an explosive nuclear yield. Such devices may be fabricated in a completely improvised manner or may result from the sabotage, seizure, theft, or loss of a U.S. or foreign nuclear weapon.

Joint Operations Center (JOC): The center established by, and under the direction of the FBI at or near the site of the event that serves as the nucleus for decision making, coordination, and overall management of ongoing operations. The JOC is an expansion of the on-scene FBI command post.

Nuclear Incident: A nuclear incident is defined as any situation involving lost, stolen, missing, or the unauthorized possession of Special Nuclear Material, Controlled Nuclear Material, By-Product Material, Source Material, nuclear weapons, or components thereof. Nuclear incidents also include the use of improvised nuclear devices, radioactive dispersal devices, or the threatened use of such items, as defined by the Atomic Energy Act (AEA) of 1954, as amended.

Nuclear Weapon: A general name given to any weapon in which an explosion results from the energy released by reaction involving atomic nuclei, either by fission or fusion, or both. A nuclear weapon may be of U.S. or foreign manufacture.

Radiation: High energy particles or gamma rays that are emitted by an atom as the substance undergoes radioactive decay. Particles can be either charged alpha or beta particles, or neutral neutron or gamma rays.

Radiological Dispersal Device (RDD): A device incorporating radioactive materials designed to be surrounded with conventional high explosives and detonated in order to scatter or otherwise contaminate an area with radioactive particles. An RDD is not designed to produce an explosive nuclear yield.

Strategic Information Operations Center (SIOC): The FBIHQ command post which coordinates actions among other headquarters level Federal agencies.



CHEMICAL/BIOLOGICAL INCIDENT CONTINGENCY PLAN UNCLASSIFIED

FEDERAL BUREAU OF INVESTIGATION

CHEMICAL/BIOLOGICAL (C/B) INCIDENT CONTINGENCY PLAN

(UNCLASSIFIED)

INTRODUCTION:

The first priority of the plan is public safety and the preservation of life. In a terrorist or other criminal-related C/B incident, the FBI will assume a central investigation and/or crisis management role, in association with local law enforcement authorities, to successfully resolve the incident. Concurrently, in a major incident, other specialized Federal entities from a variety of agencies and departments, will provide consequence management resources in support of state and local agencies. These resources are primarily designed to address health and safety issues, and include a wide variety of emergency support, including housing, food, and medical support.

The plan is designed to marshall the appropriate Federal tactical, technical, scientific, and medical support to bolster the FBI's investigative and crisis management abilities and to augment state and local resources in addressing the threat inherent in a C/B incident. The contingency plan emphasizes coordination between all participants and is particularly concerned with the bridge between law enforcement activities and the management of the medical consequences of the crisis.

If a terrorist or other criminal-related C/B incident should occur, the FBI will assume the lead Federal role to successfully resolve the incident and will closely coordinate efforts with appropriate local law enforcement agencies and other emergency authorities.

Based on the specific details of an incident, at some time during the crisis, the responsibility for consequence management and public safety will be transferred from the FBI to FEMA when the Attorney General (AG) determines that the priority law enforcement goals and objectives have been set or are outweighed by the consequence management concerns. The FBI's C/B Incident Contingency Plan attempts to clarify and address this issue and provides guidance regarding the Federal management transition from the FBI to another Federal agency in this context.

The probability of a major chemical/biological (C/B) incident occurring in the United States is difficult to quantify. However, the inevitability of a significant C/B incident is heightened by a number of factors including:

- Chemical/Biological agents are relatively inexpensive to produce.
- 2) Basic chemical precursors and biological production processes are relatively easy to acquire.
- 3) The basic knowledge required to manufacture such substances is readily available.
- 4) The impact to the public is intensified by the inability to quickly identify and/or contain the affects of such substances (particularly biological agents).
- 5) Media coverage has increased the visibility and public knowledge of the use of chemical/biological weapons, thus creating a more likely scenario for their use.
- 6) The portability of small amounts of C/B agents, (especially biological agents), make them especially useful for clandestine purposes.
- 7) The proliferation of C/B agent technology and development efforts worldwide have increased the stockpile of such weapons, thus elevating the potential for the acquisition or theft of the C/B weapons by terrorist groups.

The public safety community must be prepared to address a chemical/biological event with regard to the evacuation, containment, neutralization, removal, cleanup and disposal. Some possible scenarios may include:

- 1) The sabotage of a hazardous chemical production or storage facility.
- 2) The hijacking or premeditated destruction of a tractor-trailer or railroad tanker containing hazardous materials.
- 3) Discovering an individual or a group of individuals involved in the manufacturing or possession of a chemical/biological weapon.
- 4) The dispersal of a chemical/biological agent among the civilian population, livestock or agricultural industry.
- 5) The contamination of a municipal water or public food supply with a chemical/biological agent.
- 6) The credible threat to accomplish one of the above.

GRADUATED RESPONSE:

In order to be effective, and for law enforcement to react safely to a chemical/biological agent incident, a graduated response is appropriate. Since the first priority is public safety and the preservation of life, this graduated response by knowledgeable public safety personnel would consist of the following:

- 1) Assessment of the incident by trained responders in specialized clothing and breathing apparatus.
- 2) Emergency deployment of technical personnel and resources to the incident site.
- 3) Response and establishment of known management resources to a command post area near the incident site.

JURISDICTIONAL RESPONSIBILITIES:

As each Chemical/Biological incident will have its own specific identity, the precedence of law enforcement responsibilities may be displaced by significant health and safety issues. At such a time, the lead role will be transferred to another agency with consequence management responsibility for the incident.

Within the United States, the Federal Bureau of Investigation (FBI) has been assigned the lead law enforcement role in responding to acts of Chemical/Biological (C/B) terrorism or other criminal-related C/B incidents in which the FBI maintains jurisdiction. The FBI derives its fundamental legal jurisdiction to deter, investigate, direct, organize and prepare for a C/B incident from an assortment of Federal statutes and executive branch directives. Some of these include the following:

- 1) Title 18, USC, Section 1365 Tampering with Consumer Products;
- 2) Title 18, USC, Sections 871-879 Extortion and Threats;
- Title 18, USC, Sections 371-373 Conspiracy;
- 4) Title 18, USC, Sections 175-178 Biological Weapons Anti-Terrorism Act (BWAT);
- 5) Title 18, USC, Section 2332a Weapons of Mass Destruction.

Pursuant to this jurisdictional responsibility, the FBI will respond to all C/B incidents by marshalling specialized FBI and other Federal resources to support the Special Agent-in-Charge (SAC) when faced with a potential C/B incident. Recent legislation has made the use, attempt to use or conspiracy to use a weapon of mass destruction a Federal offense.

In addition, in 1990, the BWAT Act of 1989, was signed into law. This statute makes it illegal to manufacture or possess biological agents for use as a weapon or to assist a foreign country in the development of such a weapon. It also contains extraterritorial provisions, as well as the ability to seize and destroy biological weapons.

C/B RESPONSE PROTOCOL

In a major release of a C/B agent with or without warning, the Federal Bureau of Investigation (FBI) will assume the lead role in crisis management in the interest of public safety. The FBI will continue to fulfill its law enforcement role as the situation dictates. However, these efforts will be secondary to, and in support of, the consequence management agency designated to coordinate Federal efforts in support of state and local public entities.

Activation of a C/B Threat Assessment Plan, should begin by taking the following steps:

- 1) Make contact with the FBI FIELD OFFICE C/B Coordinator who will immediately contact FBI Headquarters in Washington, D.C.
- 2) The FBI C/B Coordinator in Washington, D.C. will contact the appropriate FBIHQ Units having responsibility in a number of areas to include tactical, hostage negotiation, criminal investigative analysis, aviation support, Bomb Technicians, FBI Laboratory and other specialized resources within the FBI.
- 3) The FBI C/B Coordinator in Washington, D.C. will contact other Federal agencies having C/B support capabilities and include some of the following:
 - A) Department of Defense, C/B Defense Agency;
 - B) Department of Defense, U.S. Army Technical Escort;
 - C) Health and Human Services, U.S. Public Health Service;
 - D) Environmental Protection Agency;

- E) Department of Agriculture, Emergency Programs;
- F) Federal Emergency Management Agency;
- G) Secretary of Defense;
- H) Health and Human Services, Center for Disease Control;
- I) Health and Human Services, Food and Drug Administration;
- J) Environmental Protection Agency.

POSSIBLE INCIDENT SCENARIOS

- 1) A verbal or written threat only;
- 2) The confirmed presence of a C/B weapon, (without dissemination of the agent);
- 3) The release of a C/B agent, resulting in limited death or injury, requiring limited consequence management;
- 4) The release of a C/B agent (with or without prior warning), resulting in substantial injury or death, and requiring significant consequence management efforts.

FBI COMMAND POST STRUCTURE

(The Joint Operations Center Concept)

The SAC in charge of the FBI's response to a C/B incident will establish an on scene FBI command post designed to effectively coordinate and direct FBI actions and the actions of other agencies in response to the crisis. As the lead Federal agency, it is the FBI's responsibility to recognize, understand and coordinate other federal agencies that have a duty to respond to a C/B incident. The standard FBI command post will be modified and function as a Joint Operations Center (JOC) under the direction of the SAC.

The JOC will be structured to include both Federal and state agencies and to enhance interagency cooperation. This command post concept has been designed to reflect the FBI's responsibility and authority as the lead Federal agency during a terrorist or criminal-related C/B incident and to facilitate the FBI management of such a complex interagency operation.

The JOC will be composed of four main groups: Command, Operations, Consequence Management and Support. Some of these groups will contain other components to assist that group in fulfilling its responsibilities. The group and components are described as follows:

COMMAND GROUP: This group will be comprised of senior officials of the FBI, DOD, USPHS, FEMA and other Federal, state and local agencies as selected by the FBI, to provide the SAC with a means to quickly coordinate and reach decisions on interagency matters that affect the resolution of the incident. Representation of agencies at Command Group briefings and meetings will be determined by the FBI SAC.

In addition, the SAC will designate a single individual to act as the point of contact (POC) between the Command Group (CG) and the FBIHQ Strategic Intelligence Operations Center (SIOC). All incoming and outgoing requests for information must go through the POC. The POC is responsible for keeping the CG and the FBIHQ/SIOC apprised of the status of the incident. Any communication occurring outside this channel should be immediately reported to the POC in order for them to keep FBIHQ/SIOC and the CG advised.

OPERATIONS GROUP: Depending on the crisis, some or all of these Command Group components within the FBI or appropriate Federal, state or local public safety entity may be staffed and used to resolve the C/B crisis:

1) <u>Intelligence Component:</u> Collects, processes analyzes and disseminates current and valid intelligence data. Provides situational briefings to the individuals/groups designated by the Command Group.

- 2) <u>Investigative Component:</u> Initiates and perpetuates the investigative activity. Documents crisis response and develops, assigns and ensures completion of investigative leads.
- 3) <u>Tactical Component:</u> Directs and coordinates all tactical personnel at the crisis site. Makes recommendations and provides situational briefs to the Command Group.
- 4) <u>Technical Component:</u> Directs and coordinates all technical personnel at the crisis site. Makes recommendations and provides situational briefs to the Command Group.
- 5) <u>Surveillance Component:</u> Directs and coordinates both ground and air surveillance units. Determines feasible options, makes recommendations, and provides situational briefs to the Command Group.
- 6) <u>Negotiations Component: Directs and coordinates</u> all negotiations personnel at the crisis site. Develops appropriate negotiation options and makes recommendations to the Command Group.

CONSEQUENCE MANAGEMENT GROUP: Established by, and under the direction of the FBI to manage the additional Federal, state and local assets that will respond to any incident that has the potential for generating mass casualties or destruction.

SUPPORT GROUP: This group will be established by and under the direction of the FBI. This group will contain representatives of organizations whose primary task is to support crisis organizations represented in the Operations Group and will be asked for personnel to staff various support components. Some of these support components include: Logistics, Legal, Media, Administrative and Liaison.

DEFINITIONS

One of the fundamental obstacles associated with the control and regulation of C/B weapons and agents is the difficulty in defining what constitutes such a weapon or agent. Due to the extensive civil uses of raw materials employed in the production of these weapons, a practical definition of what constitutes a weapon is crucial to enforcement efforts. The central factor in such a definition is the issue of intent.

Additionally, to be utilized effectively as a weapon, C/B agents must be delivered to the target. This requires some type of delivery system, usually designed to minimize contact and exposure to the perpetrator(s). Such a delivery system may include a vector, which is a living organism capable of transferring a biological agent to a victim (such as mosquitos, rats, etc.); an aerosol dispersal device; or an explosive charge designed to vaporize the substance.

The following definitions have been adopted to describe the basic nature of C/B agents:

CHEMICAL WEAPONS

Chemical weapons are defined as compounds which through their chemical properties produce lethal or damaging effects in man, animal, plants or materials. They exist as solids, liquids or gas and are classified by their effects: nerve, blood, choking or blister agents.

Chemical agents are also generally divided into three broad classifications, sometimes referred to as lethal agents, incapacitating agents and harassing agents. Lethal agents are designed to kill or severely injure. Incapacitating agents are designed to disable the victim for at least several hours. These substances include those previously mentioned: nerve, blood, choking and blister agents. Harassing agents, which include police riot agents, are designed to force people to retreat. Depending on the circumstances and conditions, even harassing agents can result in serious medical complications.

Nerve agents, according to the World Health Organization, such as Tabun, Sarin or VX, may be absorbed through the skin or respiratory tract. Exposure to nerve agents causes a disruption of nerve impulse transmissions and in sufficient quantities may cause almost instant death. Therefore, full protective clothing and a protective breathing mask are required to ensure safety. The substances are stored as liquids and are usually disseminated as aerosols by means of an explosive charge. They also may be circulated by aerosol dispensers.

Blood agents, such as hydrogen cyanide and cyanogen chloride, are generally colorless liquids widely used in commercial chemical manufacturing. Their danger lies in the fact that they interfere with cell respiration. These agents attack the body through the respiratory system and if inhaled in sufficient quantities act almost immediately. Cardiac arrest can occur almost instantly.

Even though blood agents are fast acting, they dissipate quickly, and therefore are not as effective as nerve agents, particularly in a battlefield environment. A protective mask will provide short term protection. However, these agents tend to saturate charcoal filters faster than most chemical warfare agents. They are disseminated by aerosol sprayer or vaporized by explosive charge.

Choking agents cause damage to the tissues of the respiratory system and the eyes. In sufficient amounts, secondary infections can take place and in higher concentrations death occurs. A protective mask is sufficient to provide protection, provided that the atmosphere contains sufficient oxygen to support life.

Blister agents are tissue irritants. The most common blister agent is mustard gas. This substance is a liquid with the consistency of motor oil. Significant exposure will result in death between the second day and the fourth week. In lesser amounts, exposure to blister agents causes symptoms similar to severe burns and may result in secondary infections. Although generally not lethal unless exposure is significant, inhalation or contact with the eyes results in immediate searing pain. Therefore, full protective clothing and a protective breathing mask are required to ensure safety.

The lethality of chemical warfare agents is dependent on the concentration of the agent and on the method of induction into the body.

BIOLOGICAL WEAPONS

Biological agents are generally divided into either replicating (infectious) agents, or non-replicating (non-infecting or intoxicating) agents. Replicating agents are pathogenic bacteria, viruses or fungus. Non-replicating agents are produced from replicating agents, other living organisms and plants and are called "toxins".

Biological Weapons are regarded as infectious agents or toxins which are pathogenetic to man. These may include numerous naturally occurring viruses, bacteria or fungi previously known to science as well as genetically engineered organisms previously unknown to man. These substances possess the common ability to kill or incapacitate large numbers of people. Biological weapons

are defined as any micro-organism, virus, infectious substance or toxin, capable of causing death, disease or other biological malfunction in a human, animal, plant or other living organism. Toxins are a poisonous substance produced by a living organism, but in some cases can also be man-made.

The danger of biological weapons is amplified by the fact that exposure to the agents would probably not be diagnosed until symptoms appeared. Comprehensive quick field detection and identification methods do not currently exist for these agents. Not only may an accurate diagnosis be difficult to quickly accomplish, but the value of medical treatment for some agents may be diminished once symptoms have developed. Personal protection generally consists of immunization or the application of some other post-incident medical treatment, such as the use of antibiotics. A chemical protective mask also protects personnel from biological agents.

Viruses primarily cause diseases in man. Transmission of these viruses in a weapon system would most likely be accomplished by aerosol dissemination, or the use of a vector (a living organism capable of delivering a biological weapon to a victim, such as fever, headache, nausea and vomiting, following an incubation period of a matter of days). These illnesses can be fatal if untreated.

Bacterial agents can be produced in the laboratory or purchased from a number of medical research firms. Dissemination would probably be accomplished by aerosol or natural dispersal such as food contamination. Infections are introduced through the respiratory tract. An incubation period may last from one day to several weeks and the fatality rate for untreated cases may exceed 80 percent. Water supplies are particularly susceptible to contamination by strains of certain bacteria. It is important to note, however, that it is extremely difficult to contaminate most municipal waste systems. The number of purification and filtering procedures and treatments built into municipal water systems would rid the water of any contamination. Private water supplies or water supplies that are not subjected to a rigorous purification process are at risk.

Fungal infections usually are induced through the respiratory system by breathing infected spores. Fungal infections can be spread through the civilian or agricultural population, and would be extremely difficult to detect prior to the first casualty. At this time, there are no known applications of fungal infections which would lend themselves to being used as a biological agent for a weapon.

Toxins are defined as poisonous substances made by living organisms, and can cause incapacitation or death quickly. Toxins can now be reproduced through new advances in biotechnology and pose a new problem for new generations of C/B weapons.